

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

aKF1724
.G79M47
Copy 3

United States
Department of
Agriculture

Economic
Research
Service

Commodity
Economics
Division

Dockage and Foreign Material in the Grading Standards for Wheat Exports

Stephanie A. Mercier

AD-33 Bookplate
(1-68)

NATIONAL

**A
G
R
I
C
U
L
T
U
R
A
L**



LIBRARY

It's Easy To Order Another Copy!

Just dial 1-800-999-6779. Toll free.

Ask for *Dockage and Foreign Material in the Grading Standards for Wheat Exports* (AGES 89-68).

The cost is \$5.50 per copy. For non-U.S. addresses (including Canada), add 25 percent. Charge your purchase to your VISA or MasterCard, or we can bill you. Or send a check or purchase order (made payable to ERS-NASS) to:

ERS-NASS
P.O. Box 1608
Rockville, MD 20849-1608.

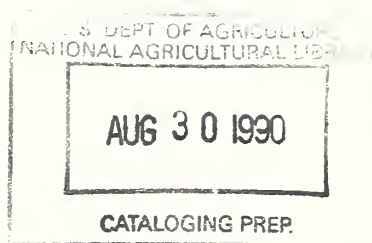
We'll fill your order by first-class mail.

Dockage and Foreign Material in the Grading Standards for Wheat Exports. By Stephanie A. Mercier. Commodity Economics Division, Economic Research Service, U.S. Department of Agriculture. Staff Report No. AGES 89-68.

Abstract

U.S. wheat exports have been compared with that of their export competitors and judged deficient by some importers, who claimed it contained excessive nonwheat material. One suggestion to remedy this problem is to combine dockage and foreign material in wheat grading standards. Estimates of the lost export revenue due to this change range from \$5.4 million in treating it as a deductible by weight to \$26.75 million for mandated cleaning without resale of screenings.

Keywords: Grain quality, grading standards, wheat dockage, foreign material, Federal Grain Inspection Service, economic costs.



Contents

	<u>Page</u>
Summary.....	v
Introduction.....	1
Dockage and Foreign Material.....	2
Quality of U.S. Wheat.....	3
Costs of the Alternatives.....	10
Grading Factor.....	11
Discount Factor.....	13
Alleviation of Costs.....	17
Conclusions.....	21
References.....	23

Summary

The U.S. Grain Standards Act Amendments of 1988 required a study exploring the effects of combining dockage and foreign material into a single grading factor for wheat (both factors defined below). This report focuses on the economic effects that such a new standard--either as a grade limit factor or as a deductible factor--would have on wheat producers, handlers, and exporters.

The United States is the only major exporter that measures and reports dockage as a quality factor separate from foreign material. Other exporters who use a state marketing system clean their wheat of such material before it leaves the export facility. Dockage, although reported on the inspection certificate, does not serve as a grading factor. It is distinguished from foreign material on the basis of particle size, weight, and ease of mechanical removal from a sample of wheat. The marketing or inspection agencies in other major exporting countries report only one measure of nonmillable material. Therefore, some importers are not comfortable distinguishing dockage and foreign material, and some importers have stated a preference to having them combined as a factor, as they are treated similarly in the milling process. Domestic millers, on the other hand, are quite comfortable with dockage as a measure. The grain that they purchase is not required to be graded so they assign discounts/premiums to factors to specify the quality they want. If adopted, the combined grading factor would primarily affect the U.S. export market.

Dockage content now appears as a negotiable item in many export contracts. Some Pacific Rim importers, such as Taiwan and Japan, have enforced strict discounts on excessive dockage. The proposed change, which would eliminate dockage as a separate factor, would permit more uniformity in export contracts. It may also encourage producers and exporters to dispatch cleaner grain which would assist in maintaining or even expanding the U.S. market share.

The economic effects of adopting a grading factor that combines dockage and foreign material were estimated for both its enforcement as a grade-determining factor and as a deductible factor. An implicit assumption in this analysis was that players in the wheat market would not immediately modify their behavior with respect to the revised grading standards. This is clearly a restrictive assumption, and, thus, the results should be regarded as maximum figures.

Considering all options, the addition of dockage to the foreign material grading standard would cost the wheat industry \$5.5-\$27.5 million, depending on the year examined for the study. These amounts are between 0.1-0.6 percent of annual value of U.S. wheat export sales. Discounting practices and price differentials in the market would likely adjust under a new grading environment. Producers could probably shift some of the cost burden, depending upon the relative market strengths of producers, exporters, and consumers.

Dockage and Foreign Material in the Grading Standards for Wheat Exports

Stephanie A. Mercier

Introduction

The quality of U.S. wheat exports has been a source of controversy for some time. Some importers have claimed that U.S. wheat quality is inferior to that of other exporters because it contains excessive nonwheat material. The competitive environment that we are seeing in agricultural trade today demands that participants seek to differentiate their product from that of their rivals, and quality, or perception of quality, is one characteristic by which such segmentation could be achieved. Much of the debate on this issue has focused on the adequacy of current grain grading standards, and is the topic of this report.

Congress in the U.S. Grain Standards Act Amendment of 1988 required the Secretary of Agriculture to conduct a study on the effects of including dockage and foreign material in a grading factor for wheat. This study was requested to determine the potential losses in revenue from combining dockage and foreign material as a single factor for assessing wheat quality. The study considered using the combined measure either as a grading factor or as a weight deduction discount.

This report summarizes the findings of an economic evaluation conducted by the Economic Research Service (ERS) in cooperation with the Federal Grain Inspection Service (FGIS). The analysis focuses on revenue losses for wheat producers, handlers, and exporters when dockage and foreign material are combined into a single grading factor. The evaluation of those losses takes place in a static setting, so prices and discount practices that prevail in the current market would be adjusted by the grain handlers concerned, as would the marketing and blending practices in use by producers and exporters. The analysis is limited to use of current procedures and prices. Thus, the numbers reflect an implicit assumption that actors in the market would not change their marketing strategies. Undoubtedly, their behavior would alter in the face of new regulations, so the estimated costs presented here can be regarded as maximums under the new market situation.

Dockage and Foreign Material

Dockage is defined as the percentage of nonmillable material, including wheat chaff and dust, weed seeds, other grains, sand, dirt, and any other material that can be removed readily with appropriate devices from a sample of wheat. Foreign material is defined as nonwheat material that cannot be mechanically separated with a Carter dockage machine from the usable wheat within the sample because the particle sizes are similar to wheat kernels. The United States is the only major wheat producer that measures and reports dockage as a separate factor on the official grade certificate for wheat. However, dockage is a nongrading factor and is removed from the sample being inspected before other factors are measured. The factors indicated as grade limits for wheat by FGIS are shown in table 1. All shiplots (total grain loaded on each ship) are sampled by FGIS before the exporting firm is permitted to load the grain at the export facility. A certificate is issued by FGIS that describes all grade-determining factors, as well as other nongrading factors (such as dockage), that the export contract specifies. The marketing or inspection agencies of other major exporters report only one measure of nonmillable material, which in some cases (particularly the EC) differs from the dockage and foreign material factors that FGIS reports. Most foreign material is cleaned from the wheat before it is exported, because of a rewarding tariff structure (public or private premiums/discounts) and only minor differences in factor limits between grades. Wheat from other countries that contains excessive nonwheat substance is often sold as feed wheat, with a different pricing schedule. Some importers of U.S. wheat are not comfortable distinguishing dockage from foreign material. Many importers have stated a preference in having dockage and foreign material combined as one factor because they are treated similarly in the milling process.

U.S. millers, on the other hand, are quite comfortable with dockage as a measure. The grain that they purchase is not required to be graded so they assign discounts/premiums to factors to specify the quality they want. If adopted, the

Table 1--Grading factors for wheat

U.S. grade weight	Min. test	Maximum limits for--					
		<u>Damaged kernels</u>		Foreign material	Shrunken, broken kernels	Total defects	Other classes
		Heat	Total				
<u>Pounds</u>		<u>Percent</u>					
No. 1	60	0.2	2.0	0.5	3.0	3.0	3.0
No. 2	58	0.2	4.0	1.0	5.0	5.0	5.0
No. 3	56	0.5	7.0	2.0	8.0	8.0	10.0
No. 4	54	1.0	10.0	3.0	12.0	12.0	10.0
No. 5	51	3.0	15.0	5.0	20.0	20.0	10.0

Note: U.S. sample grade includes wheat that does not meet the requirements for grades No. 1 to No. 5 or wheat that contains harmful or toxic substances or has any commercially objectionable odor.

combined grading factor would primarily affect our export market because domestic wheat is not usually sold on the basis of grade limit factors.

The question has been raised in the U.S. wheat industry as to why a standards change might be proposed. Many industry sources view this change as a way of reducing the amount of information on the official inspection certificate, rather than an adjustment that would lead to improving the quality of the wheat shipped. Such a modification would be counter to grading changes being considered for corn and sorghum. For those grains, consideration is being given to separating such factors on the grading certificate.

The proposed change in the wheat standards would permit more uniform export contracts and may encourage U.S. producers and exporters to seek ways to dispatch cleaner wheat, so that the U.S. market share would remain stable or increase. Currently, many U.S. wheat exporters face considerable skepticism about the continuing quality of the wheat they dispatch. The advantages of cleaner wheat have not been exploited by many U.S. wheat producers, handlers, and exporters because of existing contract specifications, the lack of a clear market for screenings, and inadequate cleaning facilities in many wheat-producing regions.

Regardless of whether dockage and foreign material would be a grading factor for wheat or treated as a deductible, the costs of such a change would be borne primarily by producers and exporters. Nearly all importers clean the wheat they import to remove nonmillable material prior to flour milling to avoid potential damage to flour quality and milling equipment. Thus, importers initially shoulder the cost of the lower quality wheat.

The costs, however, are transmitted back to the producers and exporters through discounts in contracts. Under the proposed system, importers would still bear some costs because they would pay wheat prices for nonwheat material (the sum of dockage and foreign material).

Since May 1987, dockage has been reported to the nearest 10th of a percent, rather than rounded down to the nearest 0.5 percent as had been previously required. Dockage is now reported on the certificate in the same manner as foreign material. The undercounting of dockage that prevailed before May 1987 is estimated by FGIS to have cost importers more than a cent a bushel in 1984/85. With other nongrade factors (such as moisture and protein content), many importers detail nondeductible dockage levels and sometimes maximum dockage levels in their contracts with U.S. grain-exporting firms. These importers include Taiwan, Japan, the Philippines, and Pakistan.

Quality of U.S. Wheat

Data for this study on dockage, foreign material, and other measures of quality and quantity for exported wheat were provided by FGIS (table 2). The data account for all wheat shipped from

Table 2--Dockage and foreign material in exports by wheat class¹

Class of wheat measure	1984/85	1985/86	1987/88	1984-88
	<u>Percent</u>			
Hard Red Winter:				
Foreign material	0.30	0.32	0.28	0.29
Dockage	.64	.65	.61	.62
Total	.94	.97	.89	.91
Regraded ²	35	44	31	35
Shiplots (no.)	906	837	1,862	3,605
Hard Red Spring:				
Foreign Material	.40	.23	.24	.31
Dockage	.89	.79	.82	.85
Total	1.29	1.22	1.08	1.16
Regraded ²	75	48	52	50
Shiplots (no.)	763	393	463	1,619
Durum:				
Foreign Material	.68	.61	.45	.57
Dockage	1.08	.84	1.05	.98
Total	1.76	1.45	1.50	1.55
Regraded ²	95	80	90	86
Shiplots (no.)	250	331	315	896
Soft Red Winter:				
Foreign Material	.19	.43	.32	.31
Dockage	.70	.88	.87	.85
Total	.89	1.31	1.19	1.16
Regraded ²	25	72	73	68
Shiplots (no.)	340	794	1,141	2,275
White				
Foreign Material	.29	.26	.25	.26
Dockage	.63	.69	.64	.65
Total	.92	.95	.89	.91
Regraded ²	39	40	30	31
Shiplots (no.)	434	491	839	1,754

¹Foreign material and dockage are averages for all shiplots.

²Percentage of shiplots that would not meet U.S. grade No. 2 requirements if foreign material and dockage were added.

U.S. ports from 1984 through 1988. Data for all 5 years are used to examine overall wheat quality. For analyzing potential costs of instituting these changes, data from the first and last crop years (1984/85 and 1987/88) are used. The data specify importing effects of the new grading factor by class and, to a lesser extent, by import region.

Most wheat currently exported meets U.S. No. 2 grading standards (designated grade No. 2 or better in the contracts). In general, exported U.S. wheat in 1987/88 was as clean or cleaner than it was in 1984/85, with the exception of Soft Red Winter wheat, which had a much higher average nonwheat material content after 1984 (fig. 1). The wheat crop year is from June 1 to May 30.

While the mean amount of nonwheat material declined between 1984/85 and 1987/88, more shiplots of extremely low nonwheat material (even zero content) were exported in 1987/88 than in 1984/85. The distribution of Hard Red Winter wheat shiplots exported in 1984/85 and 1987/88 are shown in figures 2 and 3. The more than 70 shiplots with measured nonwheat material at zero percent suggest there may be a market for high-quality U.S. wheat, although more study is required in this area. Similar diagrams are shown for Hard Red Spring wheat shipped in those years (figs. 4 and 5). The shapes of the distributions in figures 4 and 5 are comparable between the two crop years (excluding lots with zero nonwheat material in 1987/88).

Hard Red Winter wheat has accounted for the majority of the wheat exported by U.S. firms over the last few decades. Table 3 shows a comparison of average foreign material and dockage content for eight major importing regions during 1984-88, as well as the volume of shipments and number of shiplots.

Among regions receiving at least 50 deliveries of U.S. Hard Red Winter wheat during 1984-88, the cleanest shipments went to Central American countries and developed countries in Asia, such as Japan and South Korea. It is widely believed that some Asian countries prefer to purchase cleaner wheat, even at a premium.

Price data, however, were not available to confirm or refute this hypothesis. Shipments to South America and Africa contained the most nonwheat material. These regions contain the poorest countries of the world and receive most of the U.S. concessional wheat.

Exports of Hard Red Spring wheat showed similar patterns in recent years (table 4). The wheat with the lowest average foreign material was shipped to the Middle East. Consignments to developing Asia had relatively high foreign material content, but low dockage. Shiplots of Hard Red Spring wheat sent to South and Central America and Africa had the highest percentage of nonwheat material. The discrepancy between the two types of wheat for Central America resulted from Mexico buying the bulk of the Hard Red Winter wheat and contracting for rather low dockage and foreign material. The Hard Red Spring wheat went to other Central American nations without such strict contractual requirements.

Wheat exported from the United States has become generally cleaner during the past 5 years (in terms of both dockage and foreign material), although such factors vary with yearly harvest conditions. However, U.S. wheat still contains considerably more nonwheat material than the wheat shipped by our main competitors.

Figure 1 Percentage of dockage and foreign material
in U.S. wheat exports

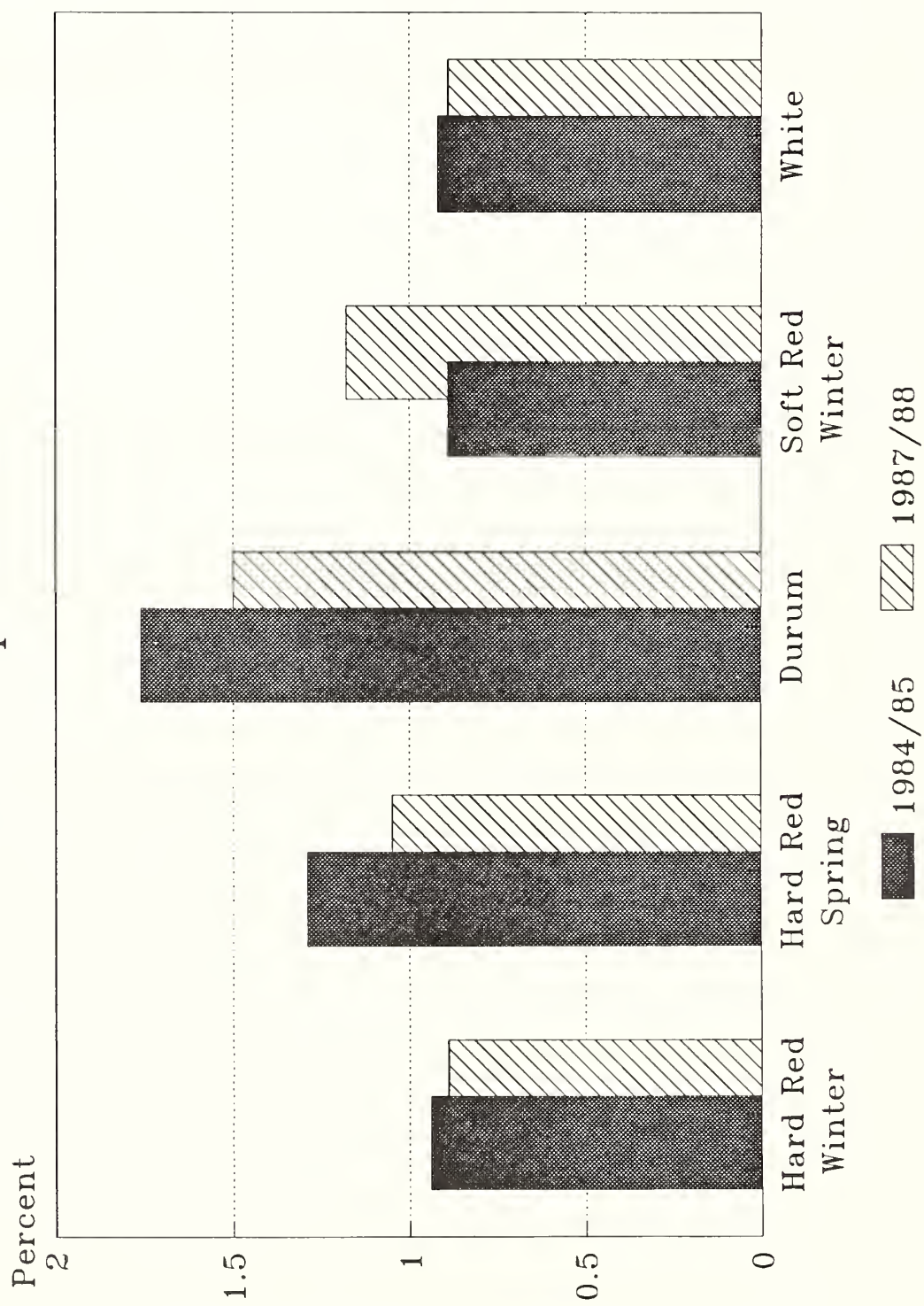


Figure 2 Shiplots of Hard Red Winter wheat graded under new nonwheat material factor, 1984/85

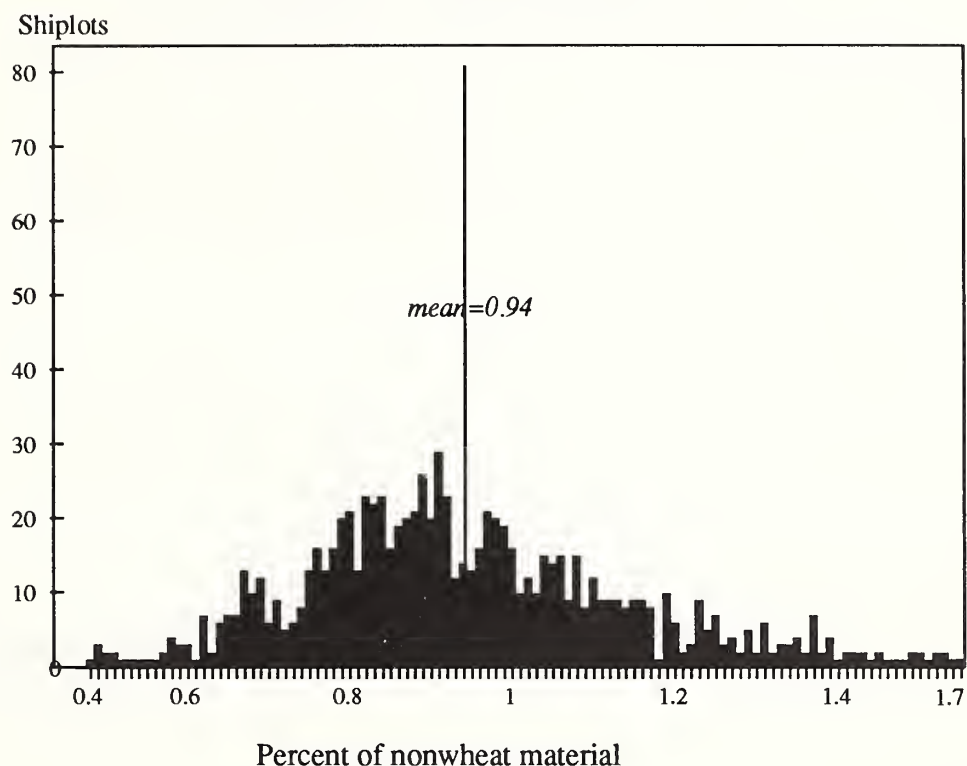


Figure 3 Shiplots of Hard Red Winter wheat graded under new nonwheat material factor, 1987/88

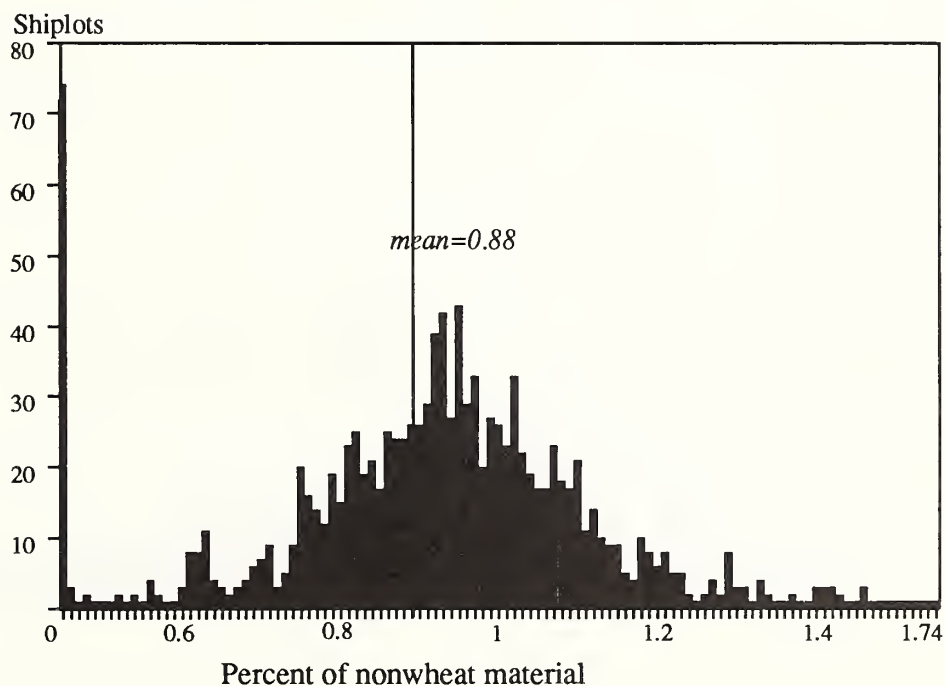


Figure 4 Shiplots of Hard Red Spring wheat graded under new grading factor, 1984/85

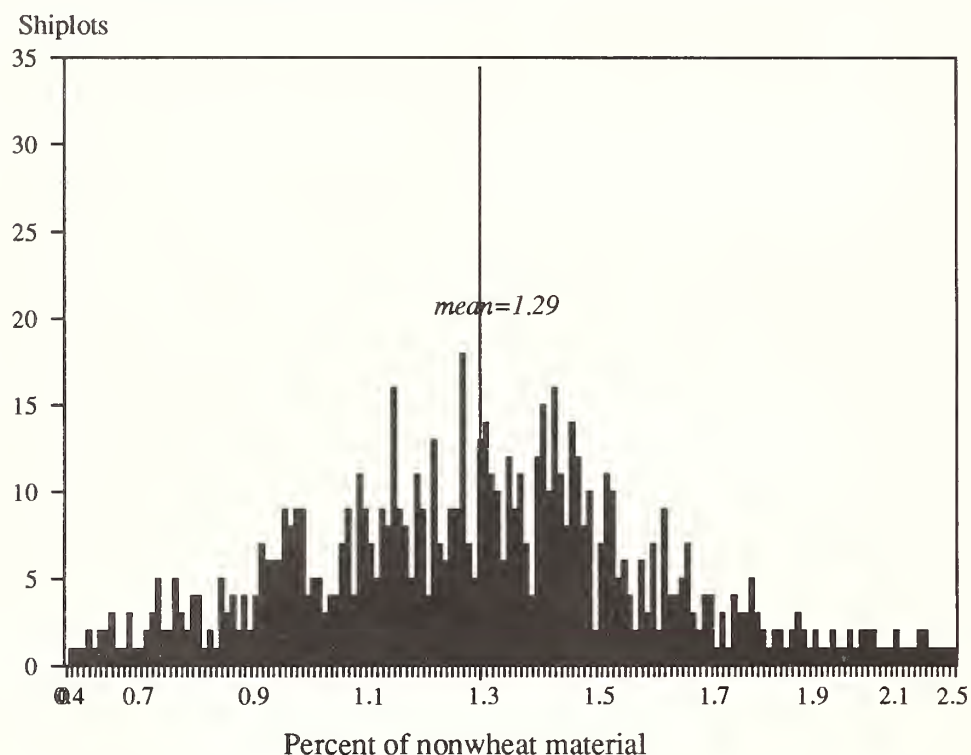


Figure 5 Shiplots of Hard Red Spring wheat graded under new grading factor, 1987/88

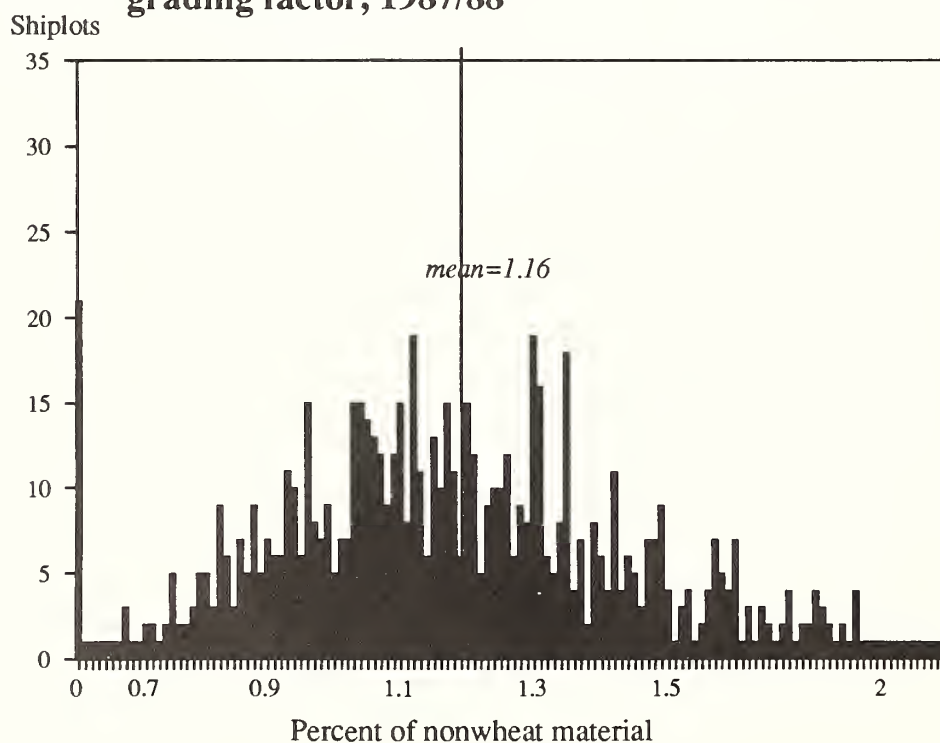


Table 3--Foreign material and dockage in Hard Red Winter exports by import regions, 1984-88 average

Region	Foreign material	Dockage	Quantity	Shiplots
	----Percent----		<u>1,000 m.t.</u>	<u>Number</u>
Central America	0.21	0.48	1,732	278
Developed Asia ¹	.27	.57	6,852	669
Developing Asia ²	.28	.62	5,986	262
Central Planned Economies ³	.30	.66	14,441	417
Middle East	.30	.64	4,691	139
South America	.32	.69	4,701	364
Africa	.32	.68	8,106	517

¹Includes Japan, South Korea, Taiwan, Hong Kong, and Singapore.

²Includes lower income Asian countries, such as India, Laos, and Pakistan.

³Includes China, the USSR, and Eastern Europe.

Table 4--Foreign material and dockage for Hard Red Spring wheat exports by import regions, 1984-88 average

Region	Foreign material	Dockage	Quantity	Shiplots
	----Percent----		<u>1,000 m.t.</u>	<u>Number</u>
Developed Asia ¹	0.28	0.81	5,496	694
Developing Asia ²	.29	.84	3,073	247
Africa	.34	.70	1,205	103
South America	.36	.95	1,529	202
Central America	.38	1.02	2,348	305
Europe	.38	.93	2,254	285

See footnotes in table 3.

Wheat exported from Canada is similar to our Hard Red Spring wheat, and in data collected by U.S. Wheat Associates for 1987/88, Canadian shipments to Japan contained on average 0.15 percent foreign material and an average dockage content of about 0.18 percent. This compares with an average foreign material content of 0.24 percent for U.S. Hard Red Spring wheat for the same year, and an average dockage content of 0.8 percent. Australian prime hard wheat exported to Japan contained an average of 0.05 percent foreign material and 0.4 percent dockage

in 1987/88. The comparable figures for U.S. Hard Red Winter wheat in the same year were 0.28 percent for foreign material and 0.61 percent for dockage.

Similar classes of wheat between countries, such as U.S. and Canadian spring wheat and U.S. hard winter and Australian prime hard winter wheat, probably contain similar amounts of nonwheat material at harvest. For instance, winter wheat is generally harvested under dry conditions by professional operators wherever it is grown, so less excess material is picked up. Spring wheat in both the United States and Canada is generally left to dry in the field before harvesting by the farmers. Canadian spring wheat and Australian prime hard wheat are cleaner at export because cleaning is required at terminal elevators by their wheat boards. Even though U.S. wheat exports have become cleaner in recent years, they still contain more dockage and foreign material than exports from competing countries. Average samples of French Soft Red Winter wheat exported in 1987 contained an average of 0.24 percent dockage and 0.07 percent foreign material, considerably cleaner than the average for U.S. Soft Red Winter wheat traded in that year (U.S. Congress).

Costs of the Alternatives

Even with relatively high levels of nonwheat matter, half or more of the shiplots of the Hard Red Spring, Hard Red Winter, and white classes would still grade U.S. No. 2 or better during 1984-88 (50, 65, and 69 percent, respectively), with current grading standards applied to the proposed new grading factor. On the other hand, at least 70 percent of Soft Red Winter and Durum classes would have been downgraded to U.S. No. 3 or lower (see table 2).

The costs of making all nonwheat material a grading factor or a deductible factor were analyzed in this study. The first alternative cost scenario for wheat had total nonwheat material exceeding the current foreign material limit of 1.0 percent so that U.S. No. 2 wheat could be regraded. Costs from the resulting price differential were estimated. In this scenario, it was assumed that the combined dockage and foreign material factor was the only grade-determining factor that forced the wheat to be regraded from U.S. No. 2 to No. 3. Thus, the price differential (table 5) used may somewhat overestimate the quality differential that would result. In the second scenario, costs were estimated using current discount schedules and the common practice of deducting for the weight of nonwheat material in the shiplot. The results of cost estimations (actually lost revenue) represent the costs assumed by suppliers in those years for dockage and foreign material. These estimates do not project costs that would necessarily occur if the standards change were made. Adjustments would certainly be made to the prices and discounts, so these figures may be regarded as maximums.

Table 5--Price differentials between U.S. No. 2
and U.S. No. 3 grade wheat, all classes

Class	Price Differential
<u>Dollars per bushel</u>	
Hard Red Winter	0.02
Hard Red Spring	.04
Durum	.06
Soft Red Winter	.03
White	.03

Source: Telephone survey of nine major grain trading firms in Gulf, Great Lakes, and Pacific regions in Feb. 1989.

Grading Factor

The cost of the change for each shiplot was estimated as the difference in prices between the respective grades. This portion of the study used price data for lower grades (No. 3 and No. 4) of wheat for all major classes. The representative price differentials prevailing in the market during the winter of 1989 were obtained from representative major grain-trading firms.

If dockage and foreign material became a grading factor, the existing price differential structure would likely narrow because purchasers would take into account that the wheat's inherent quality was not altered by the change in standards. Price differentials tend to increase when more grain of low quality appears on the market. The costs of altering the grading standards (excluding administrative costs) to include total dockage and foreign material as one grading standard (given existing price differentials) are shown in table 6.

The costs of undertaking such a standard change would have increased by more than 6 percent between the 1984/85 and the 1987/88 crop years. The costs to producers of the two major export wheat classes, Hard Red Winter and Hard Red Spring, both increased because of larger export volume in 1987/88 than in 1984/85. The price differentials during the 1984/85 crop year may have been somewhat higher than those now because the foreign material and dockage were higher, so estimated costs for 1984/85 may be biased downward.

When a sensitivity analysis was conducted, a different result emerged. The current grading standard for foreign material of 1.0 percent was relaxed for the new combined standard by increments of 0.25 percentage points (table 7).¹ The costs for

¹ None of these grading standards changes have been proposed by FGIS.

Table 6--Costs of dockage and foreign material as a grading factor for all classes of wheat exports

Class	1984/85		1987/88	
	Cost ¹	Volume ²	Cost ¹	Volume ²
	<u>Mil. dol.</u>	<u>Mil. bu.</u>	<u>Mil. dol.</u>	<u>Mil. bu.</u>
Hard Red Winter	4.46	223	5.27	263
Hard Red Spring	6.87	171	7.79	194
Durum	4.42	73	3.59	60
Soft Red Winter	1.35	44	1.96	65
White	2.85	95	1.32	44
All	18.71	606	19.93	626

¹Cost is defined as the value lost because shiplots of wheat were being regraded to No. 3 for export.

²Volume of shiplots affected by regrading.

Table 7--Cost results of sensitivity analysis for relaxing wheat grading standards

Standard ¹	1984/85	1987/88
	<u>Million dollars</u>	
1.00 percent ²	18.71	19.93
1.25 percent	10.52	8.11
1.50 percent	4.95	3.72
1.75 percent	2.80	1.73
2.00 percent	1.78	.88

¹Standard for dockage and foreign material.

²Original limit for grading wheat class No. 2 on the basis of foreign material.

1984/85 are consistently higher at each additional level than for 1987/88, except for the original level (1.0 percent), which is lower for 1984/85. This trend indicates that a great deal more wheat was shipped in 1987/88 than in 1984/85 with total dockage and foreign material falling between 1.0 and 1.25 percent.

The costs to producers and exporters of combining the two factors fell 59 percent by relaxing the standard by 0.25 percent for 1987/88, while costs fell only 44 percent for the same increment

for 1984/85. For both years, the costs dropped over 50 percent by changing the standard from 1.25 to 1.50 percent.

For both crop years, a large portion of the cost of adopting the proposed standards would fall on Durum producers, particularly at the higher tolerance levels. At the 1.25-percent level, more than 30 percent of the costs would be assessed to Durum shiplots and more than 40 percent on Hard Red Spring shiplots, while at the 2.00-percent level, Durum producers would account for around 90 percent of costs. Soft Red Winter, Hard Red Winter, and White wheat would be penalized very little in either year with nonwheat material exceeding 1.50 percent.

Discount Factor

Costs for combining dockage and foreign material as a discount factor were estimated in two ways: (1) discounting a shiplot when the amount of measured nonwheat material surpasses 1.0 percent by weight, and (2) using current discount schedules for foreign material assessed by grain trading companies at export terminals for wheat.

Market Discounts

Discounts in use during the fall of 1988 were obtained from the Kansas City Commodity Office (KCCO), Agricultural Stabilization and Conservation Service (ASCS) (table 8). The most common discount schedules provided by representative grain-trading firms were used in this analysis to evaluate the costs of discounting with the new grading factor.

The costs of the standards modification were estimated using the above discount arrangement for 1984/85 and 1987/88. Adjustments were made to account for discounts for foreign material that would have been made in current markets (fig. 6). The corrections were minor for all classes of wheat except Durum, which at a cutoff level of 0.5 percent for foreign material would have faced considerable average discounts for containing excessive foreign material in both years.

The overall cost of changing the current standard to the proposed standard would have changed gross revenue approximately \$20-22 million in the study years (table 9). The volume of wheat exported from the United States that would have been discounted increased between 1984/85 and 1987/88. Overall, wheat exports increased, so the cost of the proposed standard increased proportionally less than did the volume of exports between 1984/85 and 1987/88 (6.8 to 11.8 percent).

Hard Red Winter wheat would have been hit most heavily in terms of total costs, both because it is the dominant wheat exported from the United States and because its discount toleration point is lower (0.5 percent) than the No. 2 grade limit for wheat. The second most heavily influenced class would have been Durum wheat in 1984/85.

Table 8--Foreign material discount schedule for wheat¹

Class	Discount	Cutoff
	<u>Dollars per bushel</u>	<u>Percent</u>
Hard Red Winter	\$0.01 each 0.5 percent or fraction	0.5
Hard Red Spring	\$0.01 each 0.5 percent or fraction	.5
Durum	\$0.03 each 0.5 percent or fraction	.5
Soft Red Winter	\$0.01 each 0.5 percent or fraction	1.0
White	\$0.02 flat rate	1.0

Note: Assigned cutoff levels for Hard Red Winter, Hard Red Winter, and Durum wheat are below the U.S. No. 2 grade limit.

¹Foreign Material below this percentage is permissible.

Source: Typical standards used by grain-trading companies in the fall of 1988.

Durum wheat would be more affected because the discounting costs of between \$4 and \$5 million (about half that of Hard Red Winter) would have occurred on total shipments of less than 40 million bushels (as opposed to 700-900 million bushels for Hard Red Winter). Even though a lower volume was affected, the total discount that would have been assessed on Durum in 1984/85 was somewhat higher than for 1987/88 because the earlier crop year had more shiplots with a higher dockage content.

During the 2 years examined, the percentage of wheat that would have been discounted was fairly constant for Hard Red Winter and Hard Red Spring, but fluctuated for the other classes. The percentage of Soft Red Winter and Durum wheat that would experience deductions increased substantially between 1984/85 and 1987/88, while discounted shiplots for White wheat would have declined in number. Nearly all shiplots of Hard Red Winter, Hard Red Spring, and Durum wheat would have been affected by discounts in these years, while less than half of the shiplots of Soft Red Winter and White wheat would have been assessed a discount.

Weight Discounts

If the costs of adopting the proposed standards are estimated by discounting by weight rather than using current market discount schedules, somewhat different results appear. For the analysis of discounting by weight, all dockage and foreign material above

Figure 6 Relative discount by wheat class



Table 9--Relative costs of applying current discounts for foreign material to new standards for U.S. wheat exports

Class	1984-85		1987-88	
	Cost ¹	Volume	Cost ¹	Volume
	<u>Mil. dol.</u>	<u>Mill. bu.</u>	<u>Mil. dol.</u>	<u>Mill. bu.</u>
Hard Red Winter	9.29	693	11.34	871
Hard Red Spring	3.89	209	4.75	253
Durum	5.21	37	4.57	39
Soft Red Winter	0.52	44	0.72	65
White	1.93	95	0.88	44
All	20.85	1,079	22.27	1,271

¹Relative to discounts that would have been charged using this schedule for all shiplots in those years for foreign material only.

1.0 percent were deducted from the total weight of the shiplot delivered, while nonwheat material under that level was not penalized. For example, a shiplot of 20,000 metric tons with nonwheat material at 1.5 percent would have a deduction totaling 100 metric tons. The total weight deducted over all shiplots by class was valued at the prevailing export market price for each class of U.S. No. 2 wheat. These cost estimates are shown in table 10. The lost revenue is substantially lower than that presented in table 9, which was incurred when the market discount schedules were used. The losses would clearly increase if the amount charged for transporting the excess foreign material and dockage were included.

The amount of weight that would have been deducted from shiplots was calculated for each class in both the 1984/85 and 1987/88 crop years and was valued at export prices that prevailed in June of 1988. All shiplots with nonwheat material exceeding 1.0 percent would have value deducted for the amount of nonwheat material over the 1.0-percent cutoff. Certain companies purchasing particular classes of wheat (namely Durum and Hard Red Spring) assess an additional per bushel discount for dockage above 1.9 percent on shiplots received. If the companies currently engaged in this double penalization of dockage continue the practice under the new system, the costs discussed below would be understated.

The cost of adhering to the proposed standard, if discounts were to be assessed by weight, would have been 51 percent higher in 1984/85 than in 1987/88 at current prices. If the volume that would have been discounted in 1984/85 were to be valued at the same constant (1987/88) prices, the difference would have been less, only 24 percent higher. Over all classes, the value of the

Table 10--Costs of discounting by weight under nonwheat material standards for U.S. export wheat

Class	1984/85		1987/88	
	Cost ¹	Volume ²	Cost ¹	Volume ²
	<u>Mil. dol.</u>	<u>1,000 bu.</u>	<u>Mil. dol.</u>	<u>1,000 bu.</u>
Hard Red Winter	1.30	360	0.95	280
Hard Red Spring	2.72	638	1.84	561
Durum	2.96	625	1.89	432
Soft Red Winter	.35	108	.49	152
White	.80	210	.21	61
All classes	10.86	1,943	5.39	1,488

¹Valued at prevailing No. 2 export prices for each class in each year.

²Total bushels of foreign material and dockage that would have been deducted from all shiplots.

deducted material at 1987/88 crop year prices would have been just over \$7 million because of higher market prices prevailing in 1984/85 than in 1987/88. The volume of discounted material decreases for every class (except Soft Red Winter) between 1984/85 and 1987/88, particularly for Durum and White wheat.

Alleviation of Costs

Producers could attempt to alleviate some of the cost burden by cleaning their wheat to remove excessive dockage. In fact, using dockage and foreign material as a grading factor would create an incentive to do so, especially if the standards were not relaxed under the proposal. Cleaning at the elevator is assumed to cost farmers 3 cents a bushel for wheat with nonwheat material above 1.0 percent. Acquisition costs of the cleaning equipment are not considered, because data are not readily available. Farmers could reduce dockage at harvest by adjusting combine settings and harvesting speed, or by purchasing on-farm cleaning equipment. The costs for these activities are not known.

If the foreign material and dockage removed by the cleaning process has no economic value (case A), then the material removed above 1.0 percent (No. 2 standard) would cost farmers the value of the weight removed (table 11 and fig. 7). If the material removed has value as a livestock feed ingredient, then the loss to farmers or elevator operators would be diminished, but only by a small amount. This second scenario (case B) assumes that the screenings are sold to local feed mills, and that the screenings

Table 11--Costs of nonwheat material when wheat is cleaned
at the county elevator

Class	1984/85		1987/88	
	Case A ¹	Case B ²	Case A ¹	Case B ²
<u>Million dollars</u>				
Hard Red Winter	10.17	9.69	8.70	8.33
Hard Red Spring	6.90	6.05	7.38	6.64
Durum	4.62	3.79	3.47	2.90
Soft Red Winter	1.61	1.47	2.37	2.17
White	3.45	3.17	1.50	1.41
All	26.75	24.17	23.42	21.45

¹Scenario in which no value is attributed to screenings removed.

²Scenario in which screenings are valued at half the price of millrun from flour mills.

have a value of half the prevailing market price for millrun. The millrun price was about \$100 per metric ton or \$2.70 per bushel in late 1988. The gain per bushel from selling the screenings was estimated at \$1.35 per bushel of screenings for both 1984/85 and 1987/88. Transportation costs, that would have been incurred if the dockage material had not been removed at the country elevator level, will also be saved at a rate of 50 cents per bushel of screenings removed. Other savings that could occur from cleaning were not estimated due to lack of data; these data include storage space costs, reduced energy costs for grain-drying and maintenance, lower risk of dust explosion and insect infestation, and increased test-weight per bushel.

The costs of altering the grading standards when farmers choose to clean their wheat at the country elevator are greater for 1984/85 than for 1987/88. These costs are comparable to those reflected by other methods of calculation. The cost increases by around 10 percent for both years when the screenings are not used in byproduct feeds. The costs to producers of each class of wheat (except Hard Red Spring and Soft Red Winter) declined between 1984 and 1987 (fig. 8). If farmers remove all dockage and foreign material, instead of meeting the grade standards, both the costs (in terms of cleaning and of lost market weight) and the benefits (in terms of premiums for higher grade wheat and transportation savings) would be greater. We have not been able to account for these factors, so our analysis does not reflect the full costs and benefits.

In the near future, U.S. wheat farmers will not have sufficient facilities to clean all wheat that fails to meet U.S. No. 2 grade limits with all nonwheat material as a new grading factor.

Figure 7 Cleaning costs by wheat class, no resale

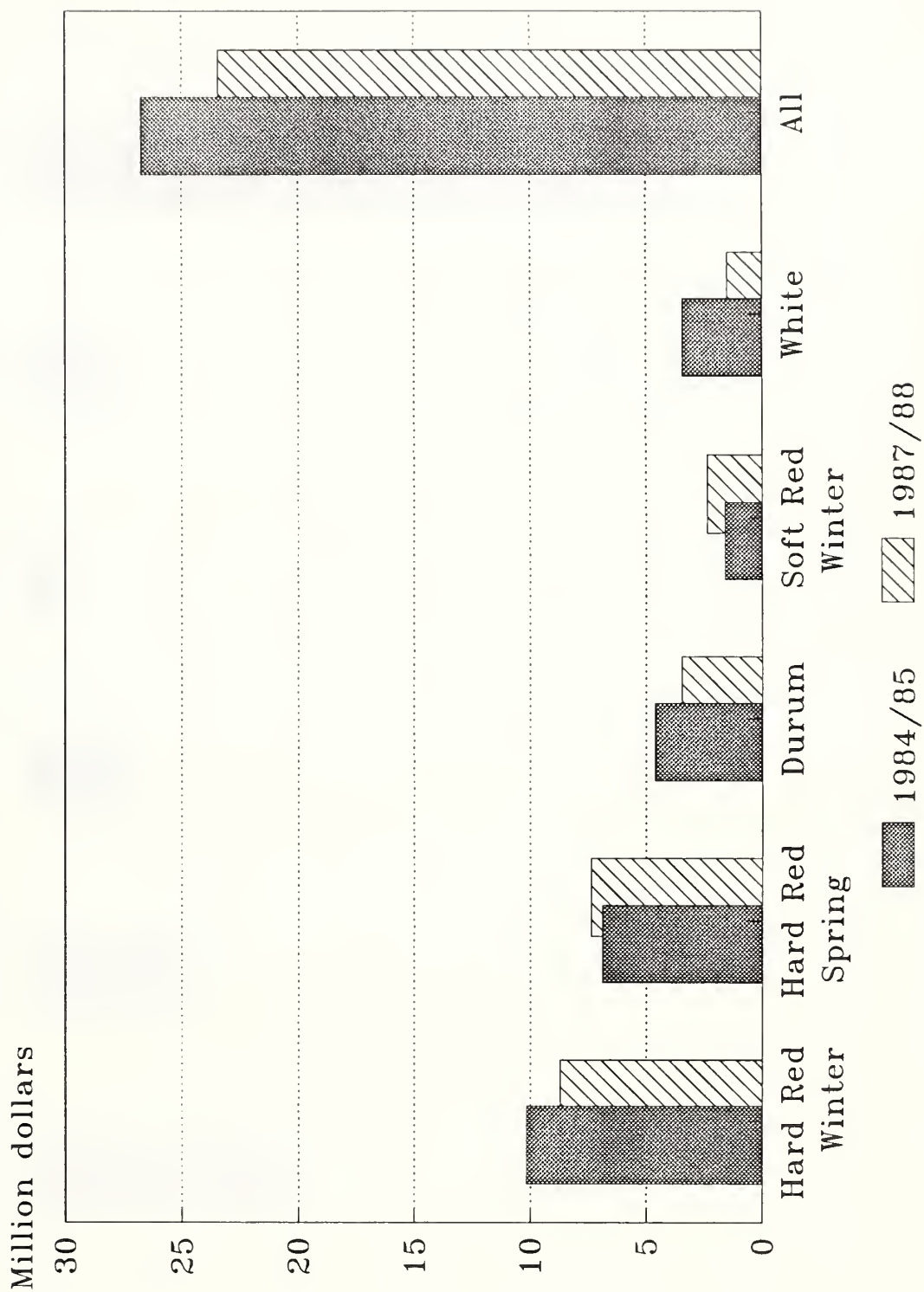
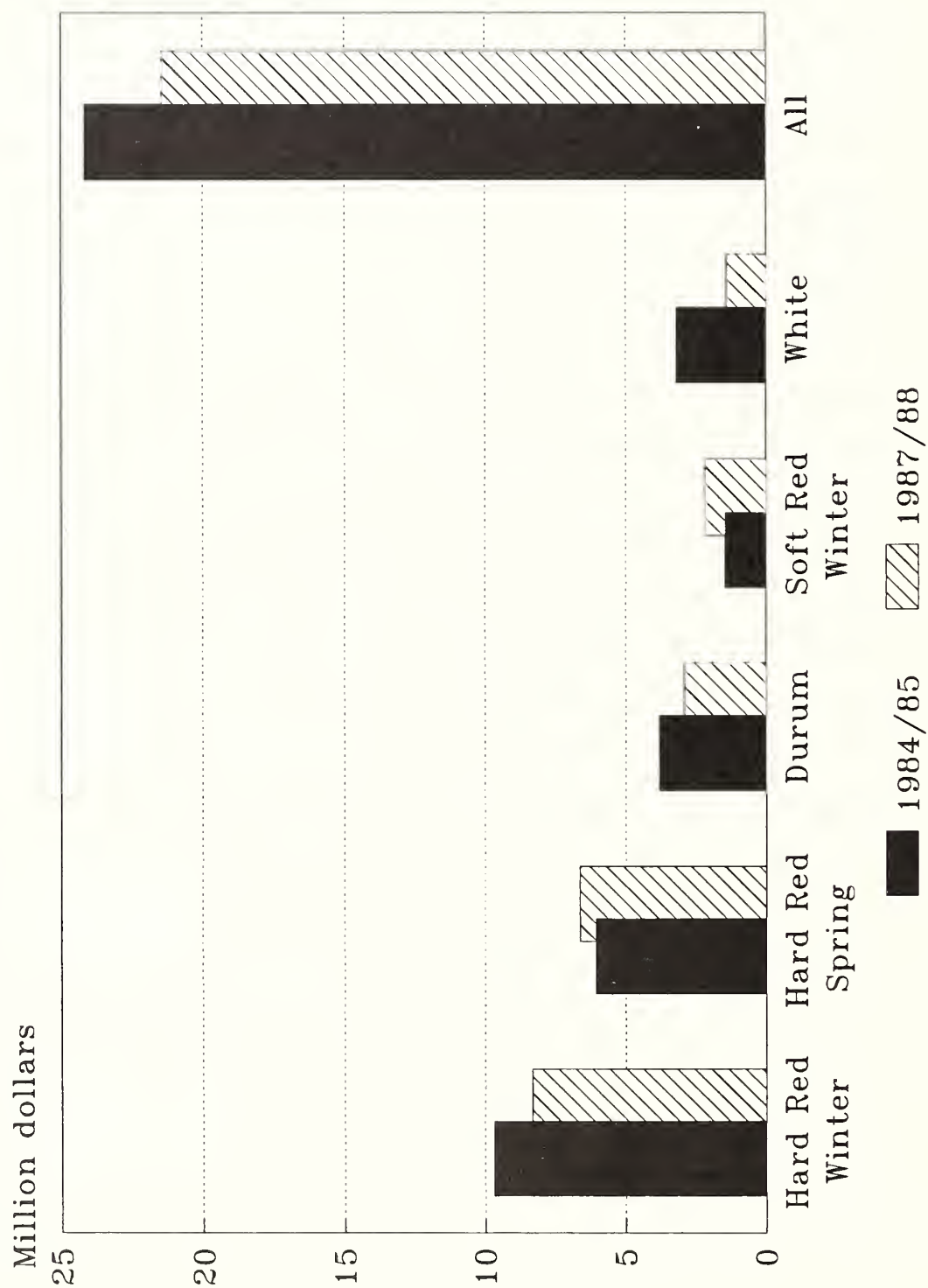


Figure 8 Cleaning costs by wheat class, with resale



Farmers living in regions in which cleaning facilities are more common in country elevators will have a distinct advantage. North Dakota currently possesses the largest number of cleaning operations, which could ease some of the lost revenue burden on Durum and Spring wheat producers in the Northern Plains. Having access to such equipment would allow farmers to engage in some marketing strategies that would recoup some losses. If, for instance, all the wheat with nonwheat material greater than 1.0 percent (the No. 2 limit) but less than 1.25 percent were to be cleaned, farmers and handlers would have more scope for blending relatively clean wheat with less clean wheat. If this had been done in the 1987/88 marketing year, the cost of cleaning and lost revenue due to down-graded wheat (net of transportation savings) would have been \$20.9 million, which is considerably less than the cost of cleaning all wheat but only 3.8 percent greater than not cleaning any of it. The U.S. wheat industry would at that point have in the marketing channel more than additional 400 million bushels of clean wheat (meeting the revised U.S. No. 2 grade standards), which could generate price incentives or give greater scope to blending, either of which would reduce costs even more.

Conclusions

By all the methods examined, the alternative grading standard that includes dockage and foreign material as a single grading factor would impose costs ranging from \$5.5 million to \$27 million (fig. 9). The foregone revenue as determined in the analysis depends on the year and the method used, and whether the factor was made a grade-determining factor or simply treated as a discount or a weight deductible. The reduced revenues constitute between 0.1 and 0.6 percent of total value of U.S. wheat exports.

Table 12--Costs of combining dockage and foreign material as a grading standard for wheat

Method	1984/85	1987/88
<u>Million dollars</u>		
Grading ¹	18.71	19.93
Discount ²	20.85	22.27
Deduct by weight ³	10.86	5.39
Clean without resale	26.75	23.42
Clean with resale ⁴	24.17	21.45

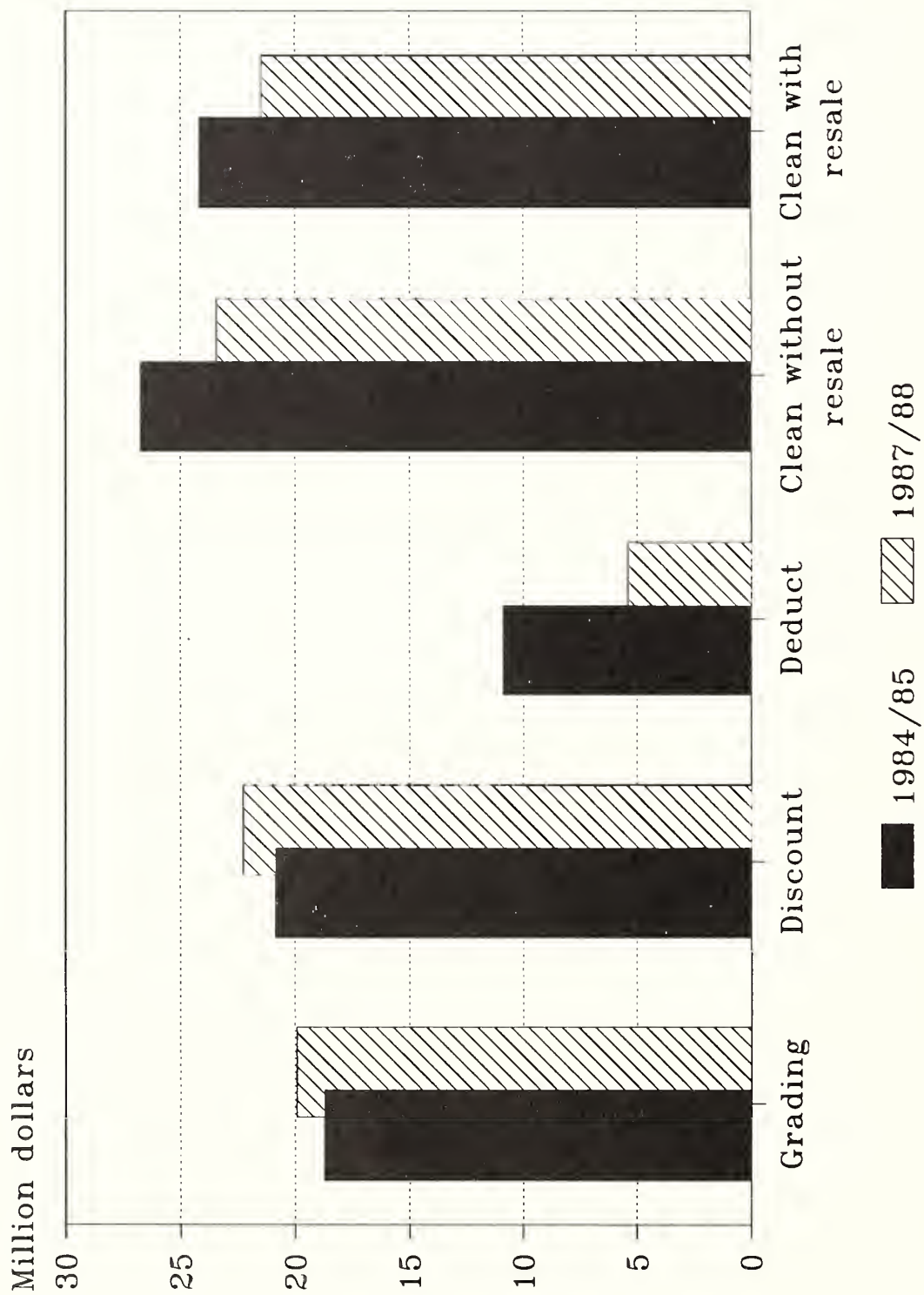
¹Valued at 1989 price differentials.

²Valued at 1987/88 crop year prices for each wheat class.

³Valued at crop year prices for each wheat class.

⁴Screenings valued at one half of 1989 millrun prices (\$1.33 a bushel).

Figure 9 Economic costs of new standard for wheat



Most of the discounting practices and price differentials currently observed in the market would likely be adjusted to reflect the new grading environment. Many of these costs could possibly be passed on to end-users or back to producers. Under most of these scenarios, the blending practice used in the industry would continue, which is likely to decrease the costs of the standards change. These costs imply no inherent improvement in wheat quality in the year that the standards change, unless widespread cleaning is adopted. Another alternative would be to undertake an effort to educate importers as to the distinction between dockage and foreign material in wheat, rather than eliminating the distinction altogether.

If the goal is to improve wheat quality, then there may be more direct ways of going about that task, such as making both dockage and foreign material grading factors, rather than combining them. The factor limit for foreign material could be lowered to 0.5 percent, a level that usually triggers discounts in the domestic market. Limiting attention to grading standards neglects many other aspects of the quality problem, such as improving production, storage, and handling techniques, which should also be considered when dealing with the grain-quality dilemma.

References

1. Hillgren, Sonja. "How Clean is Too Clean?," Agweek. Feb. 6, 1989, pp.30-31.
2. Mercier, Stephanie A., Mack N. Leath, C. Edwin Young, and William Lin. "Economic Implications of Combining Dockage and Foreign Material in the Grading Standards for Wheat." Unpublished study submitted to the U.S. Congress from Econ. Res. Serv., U.S. Dept. Agr., Mar. 1989, 26 pp.
3. U.S. Congress, Office of Technology Assessment. Enhancing the Quality of U.S. Grain for International Trade. 1989.





UNITED STATES DEPARTMENT OF AGRICULTURE
ECONOMIC RESEARCH SERVICE
1301 NEW YORK AVENUE, NW.
WASHINGTON, DC 20005-4788